CLAIMS

1. A fluid machine comprising:

   a housing having a wall defining a generally spherical interior, said housing having at least one port opening in communication with said interior of said housing;

   a first shaft mounted for rotation relative to said housing about a primary axis, wherein at least a portion of said first shaft extends through the housing wall;

   at least one primary vane disposed within said interior of said housing that rotates about said primary axis of said first shaft;

   at least one secondary vane disposed within the interior of said housing and mounted to said primary vane on a first pivotal axis, said secondary vane pivotally oscillating between alternating relatively open and closed positions with respect to said primary vane and defining at least a chamber within said housing interior having a volume which varies as said primary vane is rotated about said primary axis;

   wherein a first fluid and a second fluid flow through the fluid machine.

2. The fluid machine of claim 1 wherein said first fluid is used to power said machine and said second fluid is pumped, compressed, or vacuum pumped.

3. The fluid machine of claim 1 wherein said first fluid and said second fluid are given two different flow rates.

4. The fluid machine of claim 3 wherein said two different flow rates are provided by rotating port openings to new fixed positions relative to said primary axis.

5. The fluid machine of claim 3 wherein said two different flow rates are provided by altering the shape or face angle of one or more vanes.

6. The fluid machine of claim 5 wherein said altering the shape or face angle of one or more vanes is powered by pressurized fluid.

7. The fluid machine of claim 3 wherein said two different flow rates are provided by provision of a relatively one-way flow path between fluid chambers.

8. The fluid machine of claim 7 wherein said relatively one-way flow path between fluid chambers is accomplished via a flow path around a vane.

9. The fluid machine of claim 7 wherein said relatively one-way flow path between fluid chambers is accomplished via a flow path through a vane.

10. The fluid machine of claim 1 wherein said at least one port opening is adjustable and has a first opening capable of accommodating continuous fluid communication with an approaching closing chamber for flowing incompressible fluids but can be adjusted to a second opening for flowing compressible fluids.

11. The fluid machine of claim 10 wherein said first and second port openings are differentiated by size.

12. The fluid machine of claim 10 wherein said first and second port openings are differentiated by shape.

13. The fluid machine of claim 10 wherein said first and second port openings are accomplished by a port insert.

14. The fluid machine of claim 3 wherein said two different flow rates are provided by use of an adjustable eccentric port opening.

15. The fluid machine of claim 1 wherein said first fluid and said second fluid are provided different compression ratios.

16. The fluid machine of claim 15 wherein at least one of said different compression ratios is obtained by altering vane shape or width.

17. The fluid machine of claim 16 wherein said altering vane shape or width is powered by pressurized fluid.

18. The fluid machine of claim 1 wherein said secondary vane is adjusted in weight or density so as to provide momentum near the relatively closed position with respect to said primary vane that balances the force exerted upon said secondary vane by the fluid pressurized in said at least one chamber.

19. The fluid machine of claim 18 wherein said adjustment is achieved by modifying the density of the materials of manufacture of said secondary vane.

20. The fluid machine of claim 18 wherein said adjustment is achieved by modifying the amount of void space or total material in the construction of the secondary vane.

21. The fluid machine of claim 1 wherein said primary vane is adjusted in weight or density to be made heavy relative to the weight or density of the secondary vane to provide additional stored momentum energy, which additionally energy is advantageous in the efficient operation and smooth operation of the fluid machine.

22. The fluid machine of claim 1 wherein said secondary vane is pivotally coupled to a carrier ring, so that said secondary vane is pivotal about a second pivotal axis perpendicular to the axis of rotation of said carrier ring causing said secondary vane to reciprocate between relatively open and closed positions as said secondary vane is rotated about said primary axis by said first shaft; the axis of rotation of said carrier ring being oriented at an oblique angle in relation to said primary axis of said first shaft.

23. The fluid machine of claim 22 further comprising a second shaft that extends into said interior of said housing opposite said rotary shaft, said second shaft having

a spherical portion about which said primary vane rotates and wherein said carrier ring is rotatably carried on said spherical portion of said second shaft.

24. The fluid machine of claim 23 wherein said first shaft is rotatably coupled to said spherical portion of said second shaft to provide rigidity to the structure.

25. The fluid machine of claim 24, wherein said rotatable coupling is accomplished by an extension of a portion of said first shaft into said spherical portion of said second shaft.

26. The fluid machine of claim 24 wherein said rotatable coupling is accomplished by an extension of a portion of said spherical portion of said second shaft into said first shaft.

27. The fluid machine of claim 24; wherein a fluid channel is provided through the center of said first shaft, into said spherical portion of said second shaft, and out said second shaft, providing for a flow of lubricant and/or coolant through the interior members of said fluid machine.

28. The fluid machine of claim 23 wherein seals are installed on both primary and secondary vanes to contact said housing during operation and

wherein seals are installed on both primary and secondary vanes to contact said spherical portion of said second shaft during operation.

29. The fluid machine of claim 23 wherein said second shaft is adjustably mounted to said housing so that said second shaft can be oriented in various fixed positions, and further comprising;

an adjustable vane guide bearing member disposed within said housing, wherein the adjustable vane guide bearing member oscillates said secondary vane between relatively open and closed positions relative to said primary vane in response to rotation of said primary vane, varying the point during rotation of said first shaft and said primary vane at which said secondary vane reaches the

relatively open and closed positions relative to said housing and said port opening so that communication of said port opening with said chamber is adjusted and therefore the fluid flow volume and/or direction is adjusted.

30. The fluid machine of claim 29; wherein a fluid channel is provided through the center of said first shaft, into said spherical portion of said second shaft, and out said second shaft, providing for a flow of lubricant and/or coolant through the interior members of said fluid machine.

31. The fluid machine of claim 22 wherein said carrier ring is an exterior ring mounted in said wall of said housing.

32. A method for simultaneously flowing a first fluid and a second fluid through the same fluid machine comprising the steps of:

providing a housing having a wall defining a generally spherical interior, the housing having at least one port opening in communication with said interior of said housing through which fluid from a fluid source is allowed to flow;

providing a first shaft mounted for rotation relative to said housing about a primary axis, wherein at least a portion of said first shaft extends through said housing wall;

providing at least one primary vane disposed within the interior of the housing that rotates about said primary axis;

providing at least one secondary vane disposed within the interior of the housing and mounted to said primary vane on a first pivotal axis;

rotating said primary vane about said primary axis with said secondary vane pivotally oscillating between alternating relatively open and closed positions with respect to said primary vane, the housing, the primary vane, and the secondary vane defining a fluid chamber for containing fluid within the housing interior

having a volume that varies as the primary vane is rotated about the primary axis; and

providing a first fluid and a second fluid and connecting said first and second fluids to appropriate port openings to enable separate movement of said first and second fluids through said fluid machine.

33. The method of claim 32 wherein said first fluid is used to power said machine and said second fluid is pumped, compressed, or vacuum pumped.

34. The method of claim 32 wherein said first fluid and said second fluid are provided two different flow rates.

35. The method of claim 34 wherein said different flow rates are provided by using at least one adjustable eccentric port opening.

36. The method of claim 34 wherein said different flow rates are provided by rotating at least one port opening to a new fixed position relative to said primary axis.

37. The method of claim 34 wherein said two different flow rates are provided by altering the shape or face angle of one or more vanes.

38. The method of claim 34 wherein said first fluid and said second fluid are given two different flow rates by provision of a relatively one-way flow path between fluid chambers.

39. The method of claim 38 wherein said relatively one-way flow path between fluid chambers is accomplished via a flow path around a vane.

40. The method of claim 38 wherein said relatively one-way flow path between fluid chambers is accomplished via a flow path through a vane.

41. The method of claim 32 wherein said first fluid and said second fluid are provided different compression ratios.

42. The method of claim 41 wherein at least one of said different compression ratios is obtained by altering vane shape or width.

43. The method of claim 32 wherein said at least one port opening is adjustable and has a first opening capable of accommodating continuous fluid communication with an approaching closing chamber for pumping incompressible fluids but can be adjusted to a second opening to convert said fluid machine to a compressor for compressible fluids.

44. The method of claim 43 wherein said first and second port openings are differentiated by size.

45. The method of claim 43 wherein said first and second port openings are differentiated by shape.

46. The method of claim 43 wherein said adjustment of port opening is accomplished by a port insert.

47. The method of claim 32 wherein said primary vane is adjusted in weight or density to be made heavy relative to the weight or density of the secondary vane to provide additional stored momentum energy, which additionally energy is advantageous in the efficient operation and smooth operation of the fluid machine.

48. The method of claim 32 further comprising the step of adjusting the density and/or the weight of said secondary vane in order to provide momentum near the relatively closed position with respect to said primary vane to balance the forces exerted upon said secondary vane by the fluid pressurized in said chamber.

49. The method of claim 32 wherein said secondary vane is pivotally coupled to a carrier ring, so that said secondary vane is pivotal about a second pivotal axis perpendicular to the axis of rotation of said carrier ring causing said secondary vane to reciprocate between relatively open and closed positions as said

secondary vane is rotated about said primary axis by said first shaft; the axis of rotation of said carrier ring being oriented at an oblique angle in relation to said primary axis of said first shaft.

50. The method of claim 49, further comprising the step of providing a second shaft that extends into said interior of said housing opposite said rotary shaft, said second shaft having a spherical portion about which said primary vane rotates and wherein said carrier ring is rotatably carried on said spherical portion of said second shaft.

51. The method of claim 50, further comprising rotatably coupling said first shaft to said spherical portion of said second shaft to provide rigidity to the structure.

52. The method of claim 51, further comprising the step of flowing a lubricant and/or coolant through the center of said first shaft, into said spherical portion of said second shaft, and out said second shaft.

53. The method of claim 50, further comprising the step of providing seals on both primary and secondary vanes that contact both said housing and said spherical portion of said second shaft during operation.

54. The method of claim 50, wherein said second shaft is adjustably mounted to said housing so that said second shaft can be oriented in various fixed positions, and further comprising the step of:

moving said second shaft from a first fixed position to a second fixed position to vary the point at which the secondary vane reaches the relatively open and closed positions relative to the port so that the degree of communication of the port with the fluid chamber defined by the primary and secondary vanes can be adjusted to vary the fluid flow through the port.

55. The method of claim 49 wherein said carrier ring is provided as an exterior ring mounted in said wall of said housing.